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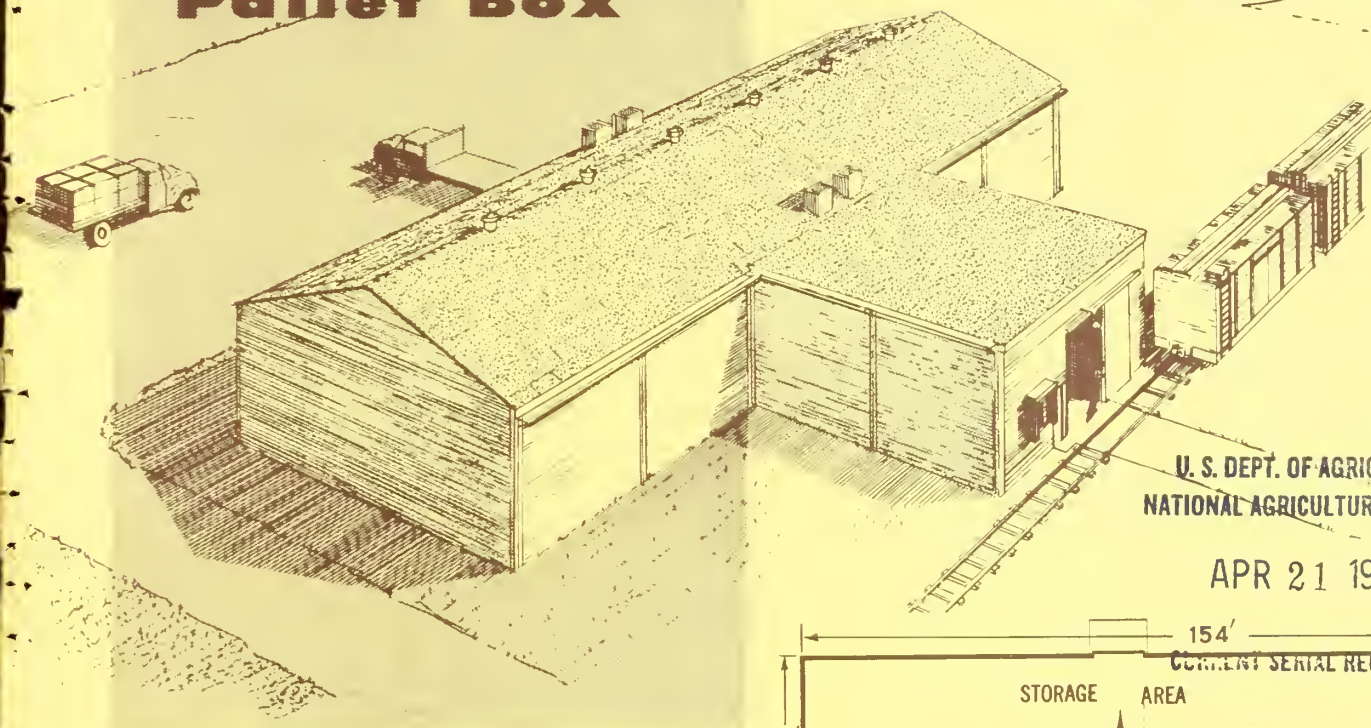
POTATO STORAGE

25,000 Cwt.

Pallet Box

COOPERATIVE FARM BUILDING
Plan No. 6038
(10 SHEETS)
PLAN EXCHANGE



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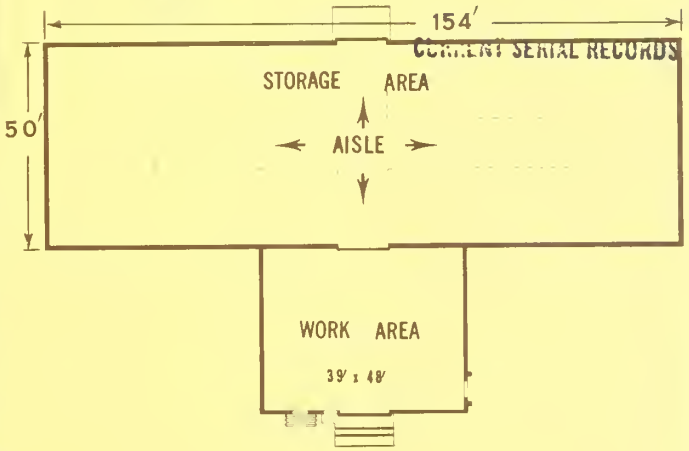

This building is designed for storing and handling potatoes in pallet boxes in the fall crop areas of the United States. It is to be used for the storage and packing of either processing or seed potatoes. The plant consists of 7,700 square feet of clear-span storage area and an additional 1,872 square feet of adjoining work area. It will hold approximately 1,250 boxes of one-ton capacity in an arrangement that leaves a cross-shaped pattern of aisles. The boxes are stacked four high. Access is by way of 12- by 14-foot doors.

The structure is single-story, wood-frame construction. Framing consists of 2- by 12-inch studs and nail-glued rafters spaced 24 inches on center. The interior of the storage is sheathed with ½-inch exterior grade plywood. The exterior siding is corrugated sheet metal. The roof is sheathed with either ⅝-inch exterior grade plywood or 1-inch dressed pine. The sheathing is then covered with lock-down, double coverage asphalt shingles. The storage is insulated with glass fiber batt insulation placed between the studs and the lower chords of the rafters. A vapor barrier is used to prevent moisture migration into the insulation from the high humidity environment. The floor is concrete slab-on-grade.

During the cold weather, both the work area and the storage area are heated. Two gas-fired furnaces, with capacities of 60,000 B.t.u. per hour each, supply the heat for the storage area, and a third unit of the same capacity supplies heat for the work area.

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STORING AND HANDLING

Potatoes are received from the field in bulk in hopper-bottom or flat-bed trucks and are placed in one-ton-capacity pallet boxes with a pallet box filler located in the work area. The boxes are then carried to the storage area with a forklift truck and stacked four high.

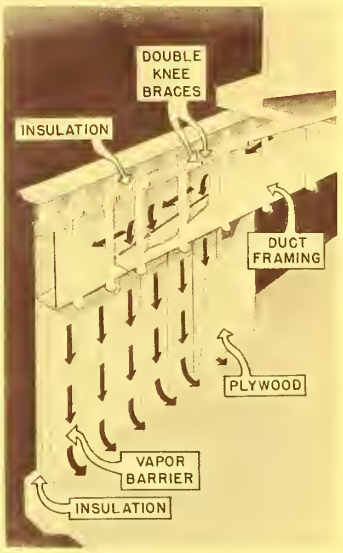
When the potatoes are to be moved from the storage, the forklift truck removes the desired boxes from the storage, transports them to the packing area, and places them individually on the pallet box tipper. The empty boxes are also handled by the forklift truck. The box tipper is used to empty the boxes at the packing line where the potatoes are cleaned, sorted, and sized. After grading they may be either bagged or moved in bulk into a highway truck or railcar.

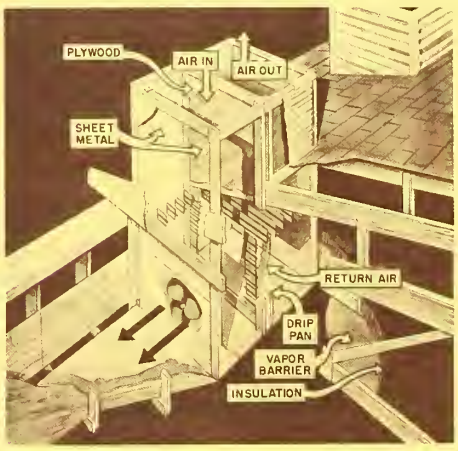
VENTILATION

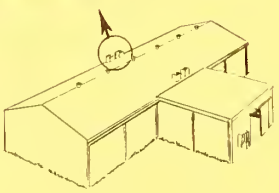
The storage has four separate ventilation units. Each ventilation unit has an axial flow propeller fan capable of delivering air at the rate of 6,300 c.f.m. at ½ inch of water static pressure. The fan is driven by a 1-hp., 3-phase, 230-volt AC motor.

The storage operator may control the air to the ventilation system manually; or the ventilation system may be automatic. The automatic system employs a differential thermostat in series with a proportioning thermostat. Both control systems are protected with a low-temperature-limit thermostat which turns on a warning system and shuts off the ventilation fan if excessively cold outside air enters the main supply duct.

This storage uses a "shell ventilation" system to distribute the air around the storage. Air is passed through large, equal-friction supply ducts located at the upper perimeter of the outside wall. The air then passes down the wall stud spaces and is discharged at the floor into the walkway space around the boxes. The air then passes around, through, and over the boxes and is returned to the fans located near the center of the sidewalls. The potato temperature in the boxes is controlled by heat transfer through the storage wall and by the wiping action of the ventilation air as it moves around, through, and over the boxes on its return to the fan systems. At the fan, air is either exhausted or recirculated, depending on the desired storage environment.







Complete working drawings may be obtained from your extension agricultural engineer at your State university. There may be a small charge to cover cost of printing.

If you do not know whom to contact in your State, send your request to Agricultural Engineer, Federal Extension Service, U.S. Department of Agriculture, Washington, D.C. 20250. He will forward your request to the correct university. ORDER PLAN NO. 6038, POTATO STORAGE—24,000 CWT. Pallet Box Storage

These plans developed by:
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